

Tobacco Rattle Virus Silencing Vector

RNA-1: LSB-1

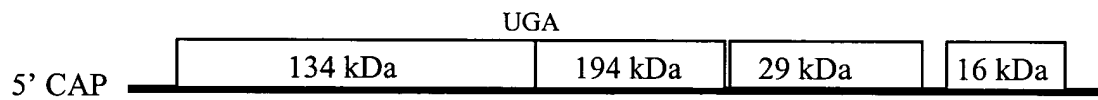


FIG. 1A

RNA-2: PpK20

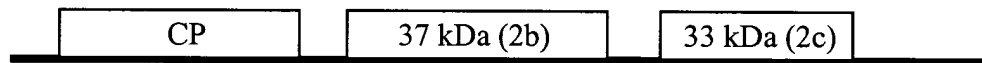


FIG. 1B

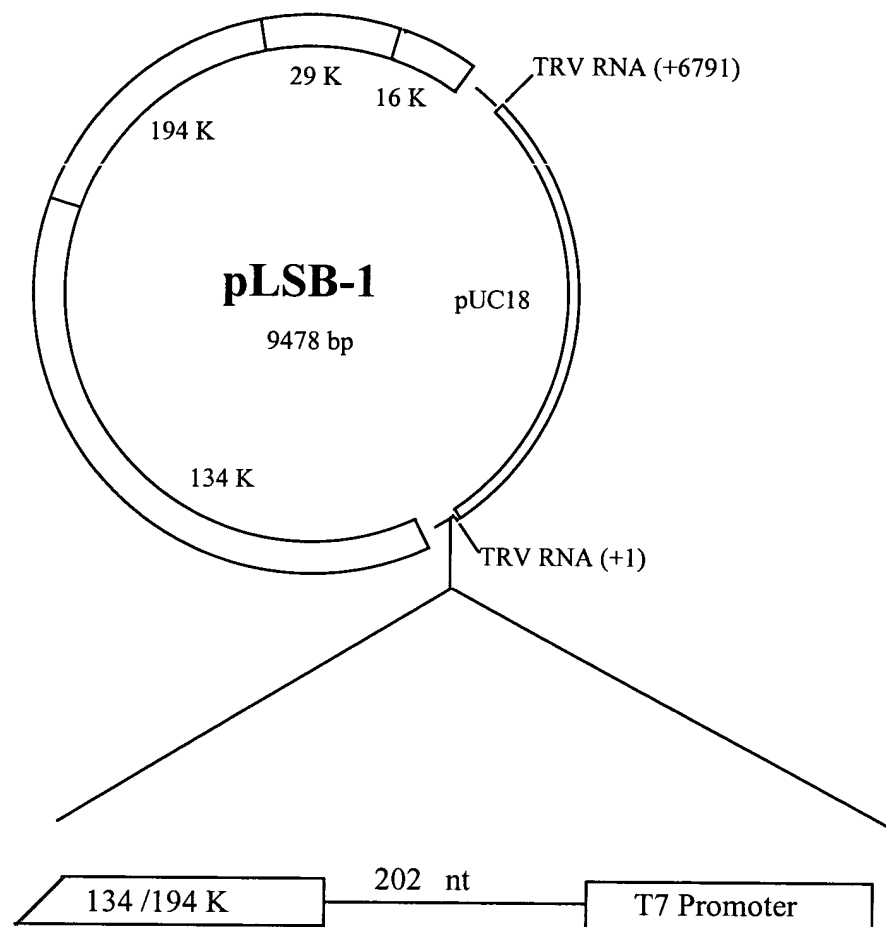


FIG. 2

ATAAAACATTTCAATCCTTTGAACGCGGTAGAACGTGCTAATTGGATTTTGGTGAGAA
CGCGGTAGAACGTACTTATCACCTACAGTTTTATTTTGTCTTTTCTTTTGGTTAATCTA
TCCAGCTTAGTACCGAGTGGGGGAAAGTGACTGGTGTGCCTAAACCTTTTCTTTGAT
ACTTTGTAAAAATACATACAGATACAATGGCGAACGGTAACTTCAAGTTGTCTCAATT
GCTCAATGTGGACGAGATGTCTGCTGAGCAGAGGAGTCATTTCTTTGACTTGATGCTG
ACTAAACCTGATTGTGAGATCGGGCAAATGATGCAAAGAGTTGTTGTTGATAAAGTCG
ATGACATGATTAGAGAAAAGAAAGACTAAAGATCCAGTGATTGTTTCATGAAGTTCTTTC
TCAGAAAGGAACAGAACAAAGTTGATGGAAATTTATCCTGAATTCAATATCGTGTTTAA
GACGACAAAAACATGGTTCATGGGTTTGC GGCTGCTGAGCGAAAACTACAAGCTTTAT
TGCTTTTAGATAGAGTTCCTGCTCTGCAAGAGGTGGATGACATCGGTGGTCAATGGTC
GTTTTGGGTAACTAGAGGTGAGAAAAGGATTCATTCCTGTTGTCCAAATCTAGATATT
CGGGATGATCAGAGAGAAAATTTCTCGACAGATATTTCTTACTGCTATTGGTGATCAAG
CTAGAAAGTGGTAAGAGACAGATGTCGGAGAATGAGCTGTGGATGTATGACCAATTTTC
GTGAAAATATTGCTGCGCCTAACGCGGTTAGGTGCAATAATACATATCAGGGTTGTAC
ATGTAGGGGTTTTTCTGATGGTAAGAAGAAAGGCGCGCAGTATGCGATAGCTCTTCAC
AGCCTGTATGACTTCAAGTTGAAAGACTTGATGGCTACTATGGTTGAGAAGAAAACTA
AAGTGGTTCATGCTGCTATGCTTTTTTGCTCCTGAAAGTATGTTAGTGGACGAAGGTCC
ATTACCTTCTGTTGACGGTACTACATGAAGAAGAACGGGAAGATCTATTTCGGTTTT
GAGAAAGATCCTTCCTTTTCTTACATTCATGACTGGGAAGAGTACAAGAAGTATCTAC
TGGGGAAGCCAGTGAGTTACCAAGGGGATGTGTTCTACTTCGAACCGTGGCAGGTGA
GAGGAGACACAATGCTTTTTTTCGATCTACAGGATAGCTGGAGTCCGAGGAGGTCTCT
ATCATCGCAAGAGTACTACCGAAGAATATATATCAGTAGATGGGAAAACATGGTTGT
TGTCCCAATTTTTCGATCTGGTTCGAATCAACGCGAGAGTTGGTCAAGAAAGACCTGTT
GTAGAGAAACAATTCATGGACAAGTGTGGATTACATAGCTAGGTTATCTGACCAGC
AGCTGACCATAAGCAATGTTAAATCATACTTGAGTTCAAATAATTGGGTCTTATTCAT
AAACGGGGCGGCCGTGAAGAACAAGCAAAGTGTAGATTCTCGAGATTACAGTTGTT
GGCTCAAACCTTTGCTAGTGAAGGAACAAGTGGCGAGACCTGTCATGAGGGAGTTGCG
TGAAGCAATTCTGACTGAGACGAAACCTATCACGTCATTGACTGATGTGCTGGGTTTA
ATATCAAGAAAACTGTGGAAGCAGTTTGCTAACAAGATCGCAGTCGGCGGATTTCGTT
GGCATGGTTGGTACTCTAATTGGATTCTATCCAAAGAAGGTACTAACCTGGGCGAAGG
ACACACCAAATGGTCCAGAACTATGTTACGAGAACTCGCACAAAACCAAGGTGATAG
TATTTCTGAGTGTTGTGTATGCCATTGGAGGAATCACGCTTATGCGTCGAGACATCCG
AGATGGACTGGTGAAAAAACTATGTGATATGTTTGATATCAAACGGGGGGCCCATGT
CTTAGACGTTGAGAATCCGTGCCGCTATTATGAAATCAACGATTTCTTTAGCAGTCTGT

FIG. 3A

ATTCGGCATCTGAGTCCGGTGAGACCGTTTTACCAGATTTATCCGAGGTAAAAGCCAA
GTCTGATAAGCTATTGCAGCAGAAGAAAGAAATCGCTGACGAGTTTCTAAGTGCAAA
ATTCTCTAACTATTCTGGCAGTTCGGTGAGAACTTCTCCACCATCGGTGGTCGGTTCAT
CTCGAAGCGGACTGGGTCTGTTGTTGGAAGACAGTAACGTGCTGACCCAAGCTAGAG
TTGGAGTTTCAAGAAAGGTAGACGATGAGGAGATCATGGAGCAGTTTCTGAGTGGTCT
TTATTGACACTGAAGCAGAAATTGACGAGGTGTTTTCAGCCTTTTCAGCTGAATGTGA
AAGAGGGGAAACAAGCGGTACAAAGGTGTTGTGTAAACCTTTAACGCCACCAGGATT
TGAGAACGTGTTGCCAGCTGTCAAACCTTTGGTCAGCAAAGGAAAAACGGTCAAACG
TGTCGATTACTTCCAAGTGATGGGAGGTGAGAGATTACCAAAAAGGCCGGTTGTCAGT
GGAGACGATTCTGTGGACGCTAGAAGAGAGTTTCTGTACTACTTAGATGCGGAGAGA
GTCGCTCAAAATGATGAAATTATGTCTCTGTATCGTGACTATTTCGAGAGGAGTTATTC
GAACTGGAGGTCAGAATTACCCGCACGGACTGGGAGTGTGGGATGTGGAGATGAAGA
ACTGGTGCATACGTCCAGTGGTCACTGAACATGCTTATGTGTTCCAACCAGACAAACG
TATGGATGATTGGTCGGGATACTTAGAAGTGGCTGTTTGGGAACGAGGTATGTTGGTC
AACGACTTCGCGGTCGAAAGGATGAGTGATTATGTCATAGTTTGCGATCAGACGTATC
TTTGCAATAACAGGTTGATCTTGGACAATTTAAGTGCCCTGGATCTAGGACCAGTTAA
CTGTTCTTTTGAATTAGTTGACGGTGTACCTGGTTGTGGTAAGTCGACAATGATTGTCA
ACTCAGCTAATCCTTGTGTGATGTGGTTCTCTCTACTGGGAGAGCAGCAACCGACGA
CTTGATCGAGAGATTTCGCGAGCAAAGGTTTTCCATGCAAATTGAAAAGGAGAGTGAA
GACGGTTGATTCTTTTTTGATGCATTGTGTGATGGTTCTTTAACCGGAGACGTGTTGC
ATTTTCGACGAAGCTCTCATGGCCCATGCTGGTATGGTGTACTTTTTCGCTCAGATAGCT
GGTGCTAAACGATGTATCTGTCAAGGAGATCAGAATCAAATTTCTTCAAGCCTAGGG
TATCTCAAGTTGATTTGAGGTTTTCTAGTCTGGTCGAAAGTTTGACATTGTTACAGAA
AAAAGAGAACTTACAGAAGTCCAGCAGATGTGGCTGCCGTATTGAACAAGTACTAT
ACTGGAGATGTCAGAACACATAACGCGACTGCTAATTCGATGACGGTGAGGAAGATT
GTGTCTAAAGAACAGGTTTTCTTTGAAGCCCGGTGCTCAGTACATAACTTTCCTTCAGTC
TGAGAAGAAGGAGTTGGTAAATTTGTTGGCATTGAGGAAAGTGGCAGCTAAAGTGAG
TACAGTACACGAGTCGCAAGGAGAGACATTCAAAGATGTAGTCCTAGTCAGGACGAA
ACCTACGGATGACTCAATCGCTAGAGGTCGGGAGTACTTAATCGTGGCGTTGTCGCGT
CACACACAATCACTTGTGTATGAAACTGTGAAAGAGGACGATGTAAGCAAAGAGATC
AGGGAAAGTGCCGCGCTTACGAAGGCGGCTTTGGCAAGATTTTTTGTACTGAGACCG
TCTTATGACGGTTTCGGTCTAGGTTTGATGTCTTTAGACATCATGAAGGGCCTTGCGCC
GTTCCAGATTCAGGTACGATTACGGAATTGGAGATGTGGTACGACGCTTTGTTTCCGG
GAAATTCGTTAAGAGACTCAAGCCTAGACGGGTATTTGGTGGCAACGACTGATTGCA

FIG. 3B

ATTTGCGATTAGACAATGTTACGATCAAAAAGTGGAAACTGGAAAGACAAGTTTGCTG
AAAAAGAAACGTTTCTGAAACCGGTTATTCGTACTGCTATGCCTGACAAAAGGAAGA
CTACTCAGTTGGAGAGTTTGTAGCATTGCAGAAAAGGAACCAAGCGGCACCCGATCT
ACAAGAAAATGTGCACGCGACAGTTCTAATCGAAGAGACGATGAAGAAGCTGAAATC
TGTTGTCTACGATGTGGGAAAAATTTCGGGCTGATCCTATTGTCAATAGAGCTCAAATG
GAGAGATGGTGGAGAAATCAAAGCACAGCGGTACAGGCTAAGGTAGTAGCAGATGT
GAGAGAGTTACATGAAATAGACTATTCGTCTTACATGTATATGATCAAATCTGACGTG
AAACCTAAGACTGATTTAACACCGCAATTTGAATACTCAGCTCTACAGACTGTTGTGT
ATCACGAGAAGTTGATCAACTCGTTGTTTCGGTCCAATTTTCAAAGAAATTAATGAACG
CAAGTTGGATGCTATGCAACCACATTTTGTGTTCAACACGAGAATGACATCGAGTGAT
TTAAACGATCGAGTGAAAGTTCTTAAATACGGAAGCGGCTTACGACTTTGTTGAGATAG
ACATGTCTAAATTCGACAAGTCGGCAAATCGCTTCCATTTACAACTGCAGCTGGAGAT
TTACAGGTTATTTGGGCTGGATGAGTGGGCGGCCCTTCCTTTGGGAGGTGTCGCACACT
CAAATACTGTGAGAGATATTCAAAATGGTATGATGGCGCATATTTGGTACCAACAAA
AGAGTGGAGATGCTGATACTTATAATGCAAATTCAGATAGAACACTGTGTGCGCTCTT
GTCTGAATTACCATTGGAGAAAGCAGTCATGGTTACATATGGAGGAGATGACTCACTG
ATTGCGTTTCCTAGAGGAACGCAGTTTGTGATCCGTGTCCAAAGTTGGCTACTAAGT
GGAATTTTCGAGTGCAAGATTTTTAAGTACGATGTCCCAATGTTTTGTGGGAAGTTCTT
GCTTAAGACGTCATCGTGTTACGAGTTCGTGCCAGATCCGGTAAAAGTTCTGACGAAG
TTGGGGAAAAAGAGTATAAAGGATGTGCAACATTTGGCCGAGATCTACATCTCGCTG
AATGATTCCAATAGAGCTCTTGGGAACTACATGGTGGTATCCAACTGTCCGAGTCTG
TTTCAGACCGGTATTTGTACAAAGGTGATTCTGTTCATGCGCTTTGTGCGCTATGGAAG
CATATTAAGAGTTTTACAGCTCTGTGTACATTATTCGAGACGAAAACGATAAGGAAT
TGAACCCGGCTAAGGTTGATTGGAAGAAGGCACAGAGAGCTGTGTCAAACTTTTACG
ACTGGTAATATGGAAGACAAGTCATTGGTCACCTTGAAGAAGAAGACTTTTCGAAGTCT
CAAAATTTCTCAAATCTAGGGGCCATTGAATTGTTTGTGGACGGTAGGAGGAAGAGAC
CGAAGTATTTTCACAGAAGAAGAGAACTGTCCTAAATCATGTTGGTGGGAAGAAGA
GTGAACACAAGTTAGACGTTTTTTGACCAAAGGGATTACAAAATGATTAATCTTACGC
GTTTCTAAAGATAGTAGGTGTACAACTAGTTGTAACATCACATCTACCTGCAGATACG
CCTGGGTTCAATCAAATCGATCTGTTGGATTCGAGACTTACTGAGAAAAGAAAGAGAG
GAAAGACTATTCAGAGATTCAAAGCTCGAGCTTTCGATAACTGTTTCAGTTGCGCAGTA
CAAGGTTGAATACAGTATTTCCACACAGGAGAACGTACTTGATGTCTGGAAGGTGGGT
TGTATTTCTGAGGGCGTTCCGGTCTGTGACGGTACATACCCTTTCAGTATCGAAGTGTC
GCTAATATGGGTTGCTACTGATTCGACTAGGCGCCTCAATGTGGAAGAAGTGAACAGT

FIG. 3C

TCGGATTACATTGAAGGCGATTTTACCGATCAAGAGGTTTTCGGTGAGTTCATGTCTTT
GAAACAAGTGGAGATGAAGACGATTGAGGCGAAGTACGATGGTCCTTACAGACCAGC
TACTACTAGACCTAAGTCATTATTGTCAAGTGAAGATGTTAAGAGAGCGTCTAATAAG
AAAAACTCGTCTTAATGCATAAAGAAATTTATTGTCAATATGACGTGTGTACTCAAGG
GTTGTGTGAATGAAGTCACTGTTCTTGGTCACGAGACGTGTAGTATCGGTCATGCTAA
CAAATTGCGAAAGCAAGTTGCTGACATGGTTGGTGTACACGTAGGTGTGCGGAAAA
TAATTGTGGATGGTTTGTCTGTGTTGTTATCAATGATTTTACTTTTGATGTGTATAATTG
TTGTGGCCGTAGTCACCTTGAAAAGTGTCTGTAACGTGTTGAAACAAGAAATCGAGA
AATTTGGAAACAAATTCGACGAAATCAAGCTGAAAACATGTCTGCGACAGCTAAAAA
GTCTCATAATTCGAAGACCTCTAAGAAGAAATTCAAAGAGGACAGAGAATTTGGGAC
ACCAAAAAGATTTTAAAGAGATGATGTTCCTTTCGGGATTGATCGTTTGTGCTTTTT
GATTTTATTTTATATTGTTATCTGTTTCTGTGTATAGACTGTTTGAGATTGGCGCTTGGC
CGACTCATTGTCTTACCATAGGGGAACGGACTTTGTTTGTGTTGTTATTTTATTTGTAT
TTTATTTAAATTCTCAATGATCTGAAAAGGCCTCGAGGCTAAGAGATTATTGGGGGGT
GAGTAAGTACTTTTAAAGTGATGATGGTTACAAAGGCAAAAGGGGTAAAACCCCTCG
CCTACGTAAGCGTTATTACGCCC-3' (SEQ ID NO: X).

FIG. 3D

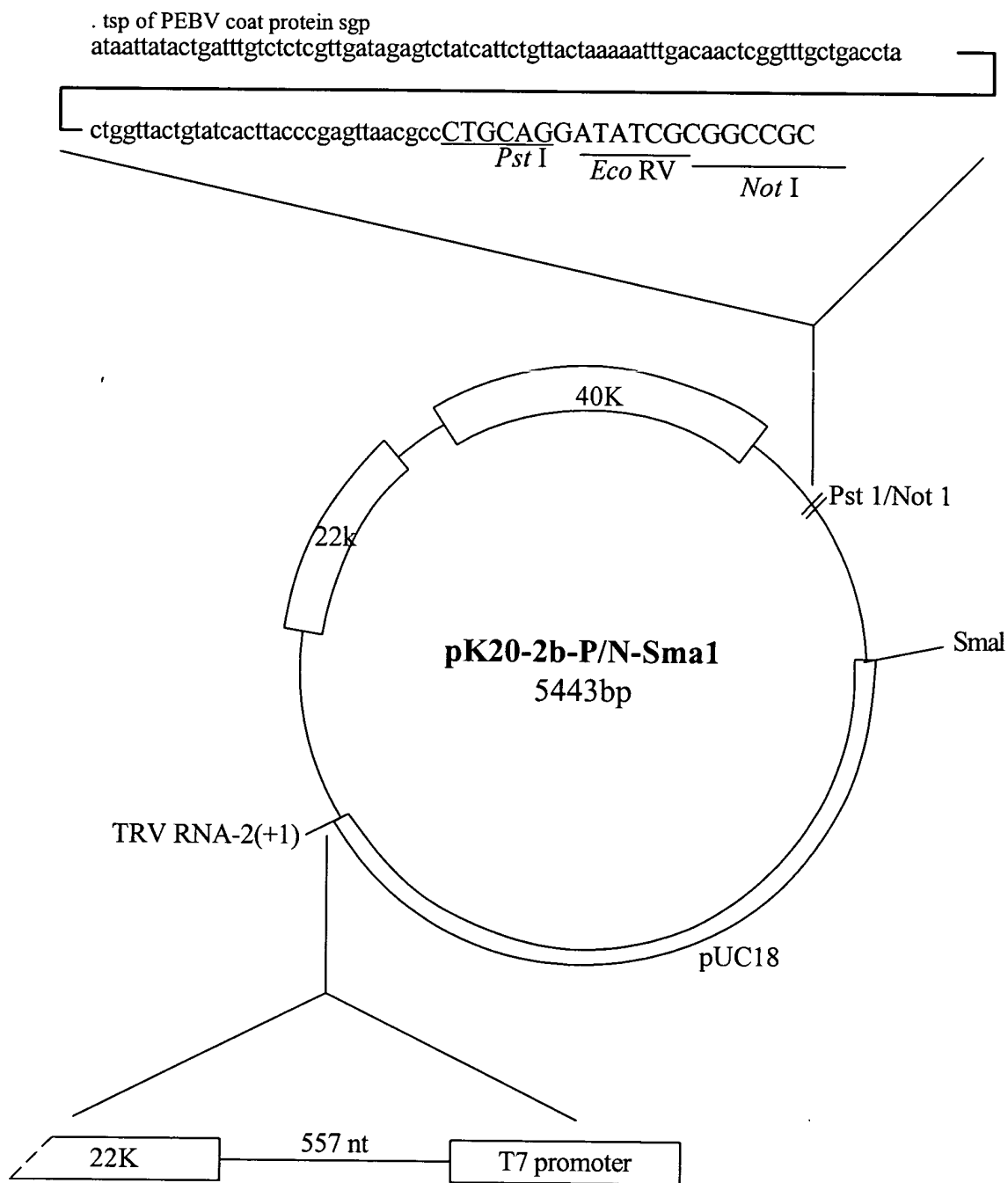


FIG. 4

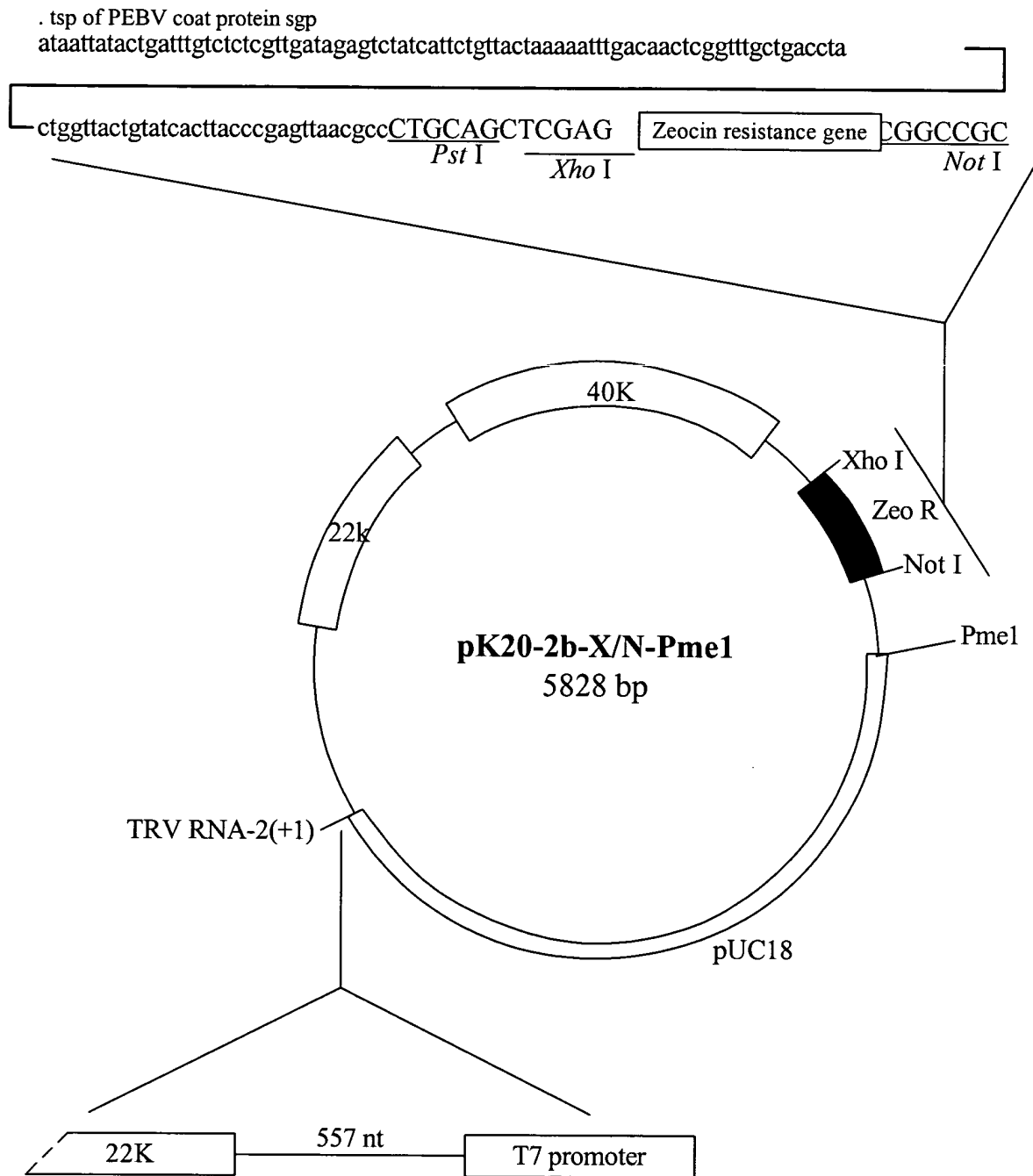


FIG. 5

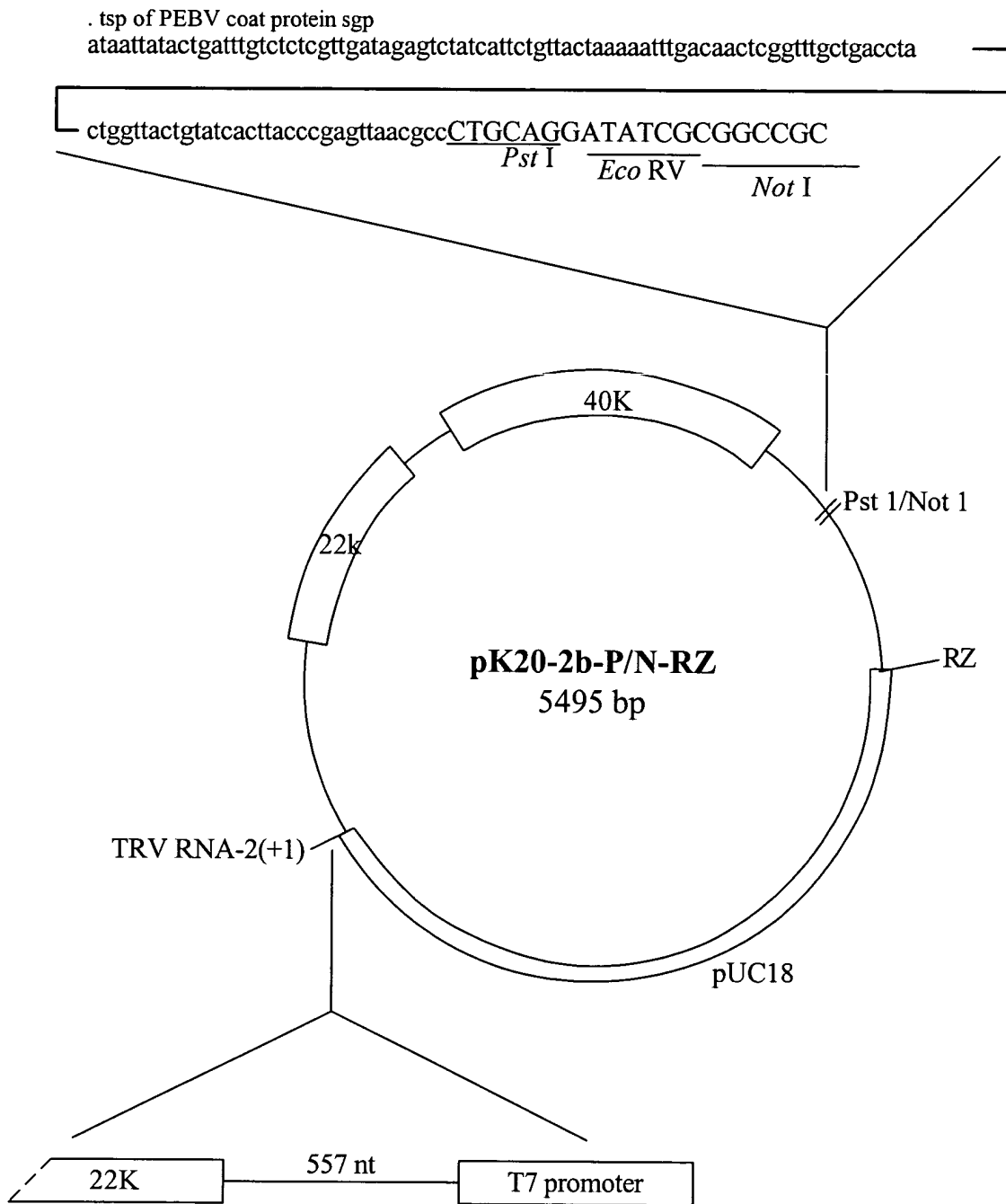


FIG. 6

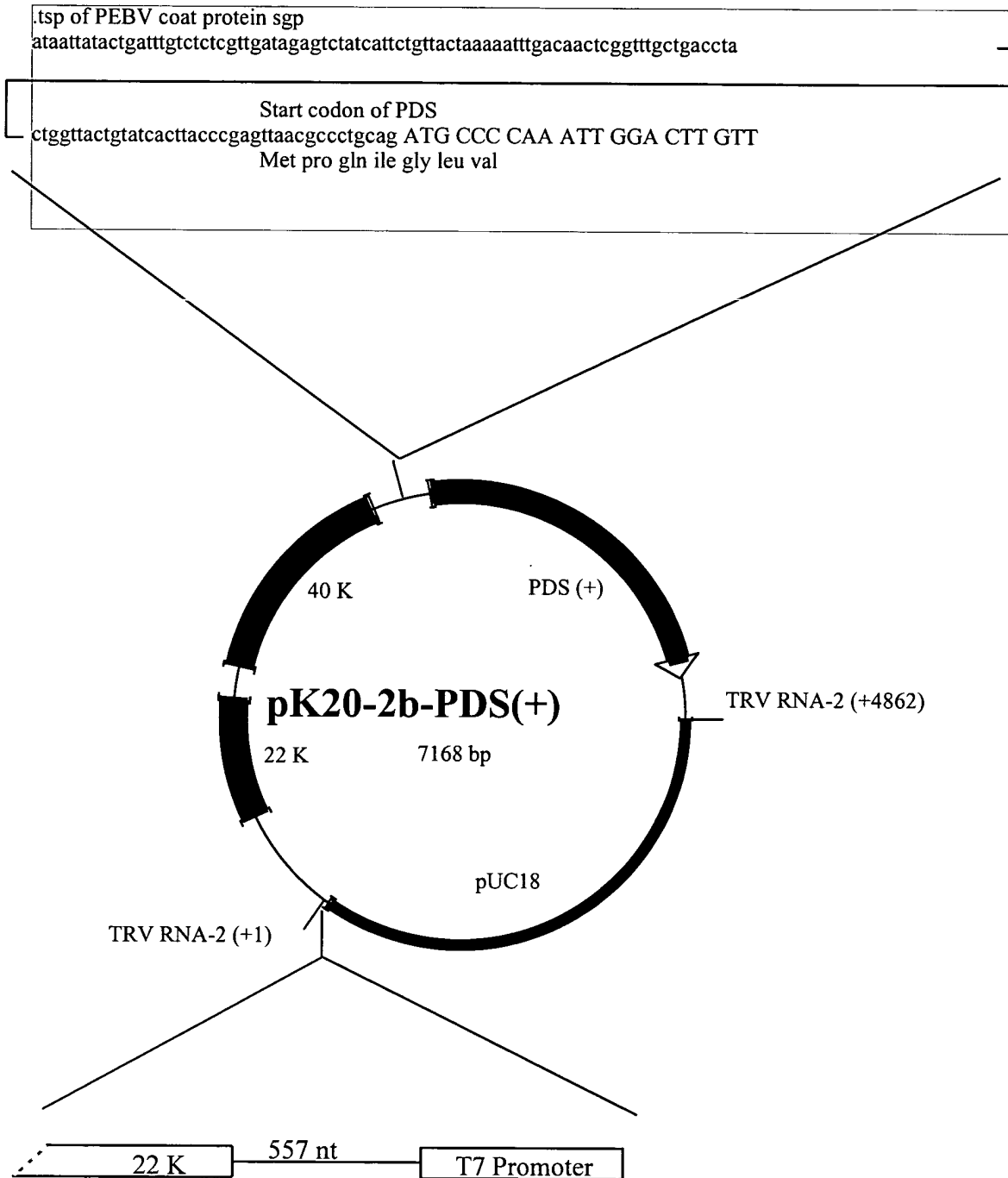


FIG. 7

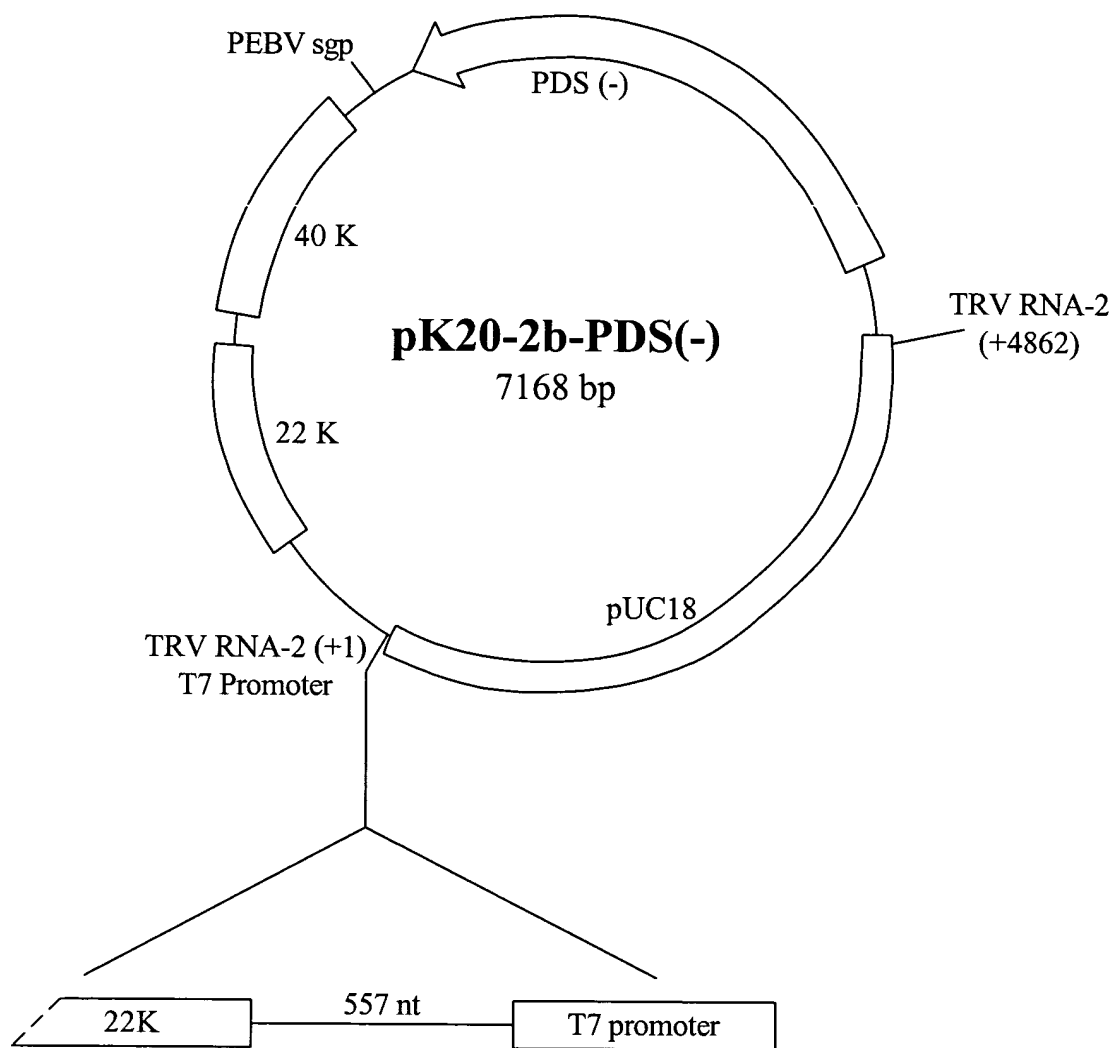


FIG. 8

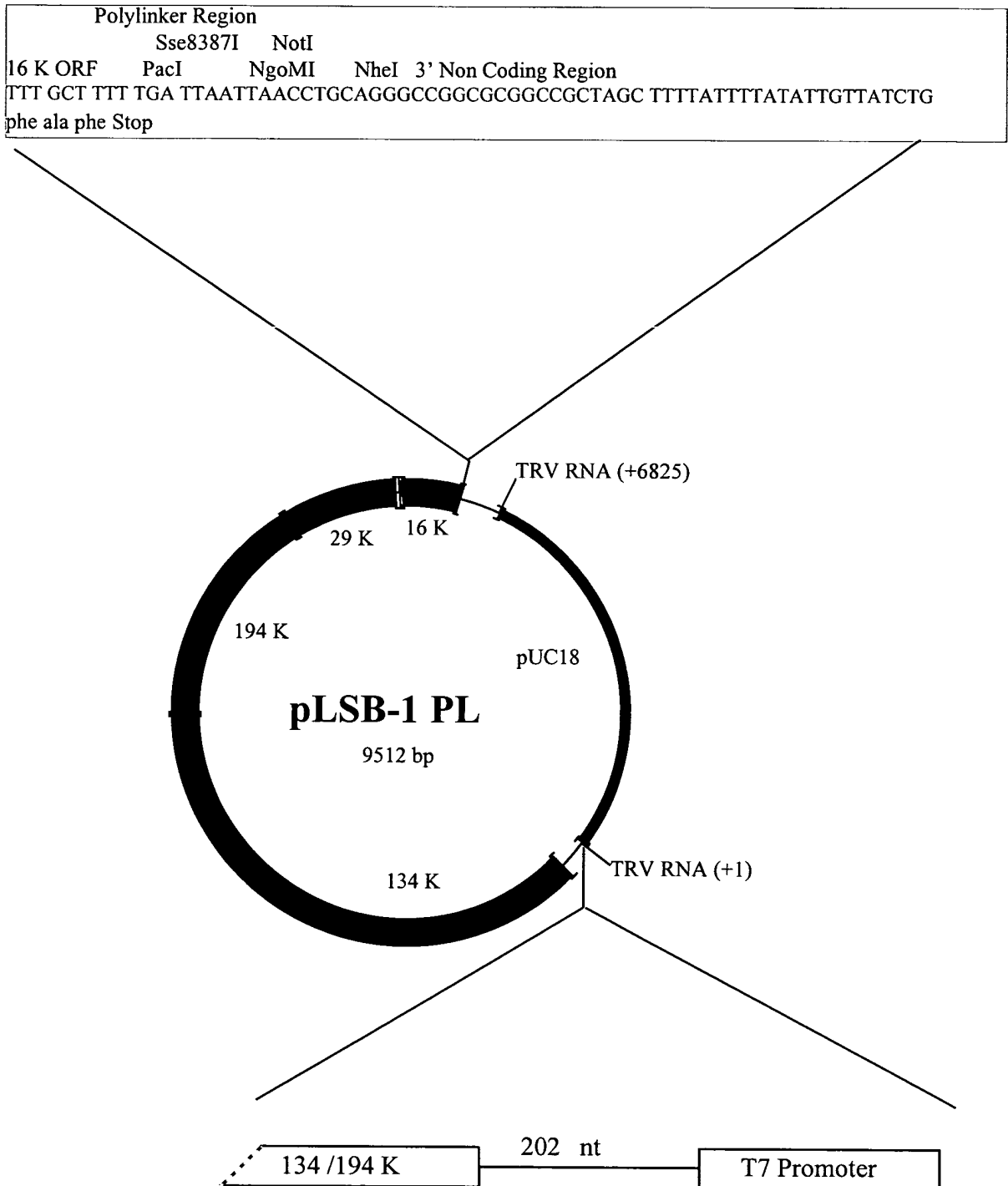


FIG. 9

16 K ORF Polylinker Start Codon of PDS
 TTT GCT TTT TGA TTAATTAACCTGCAT ATG CCC CAA ATT GGA CTT GTT
 phe ala phe Stop met pro gln ile gly leu val

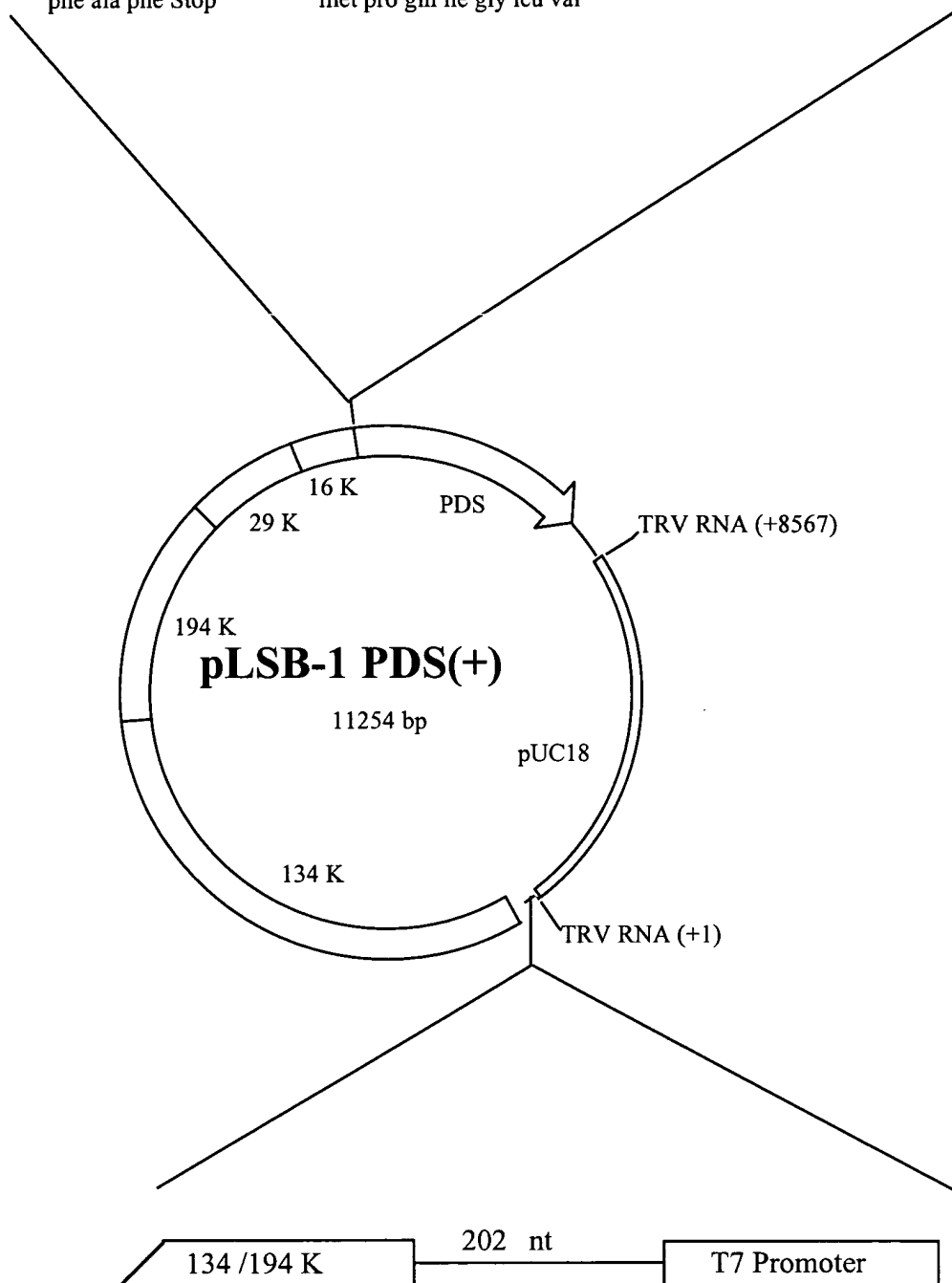


FIG. 10

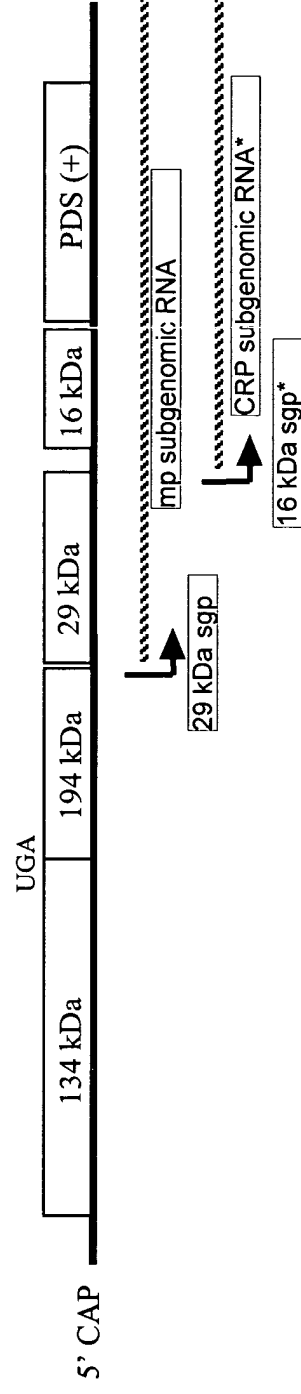


FIG. 11

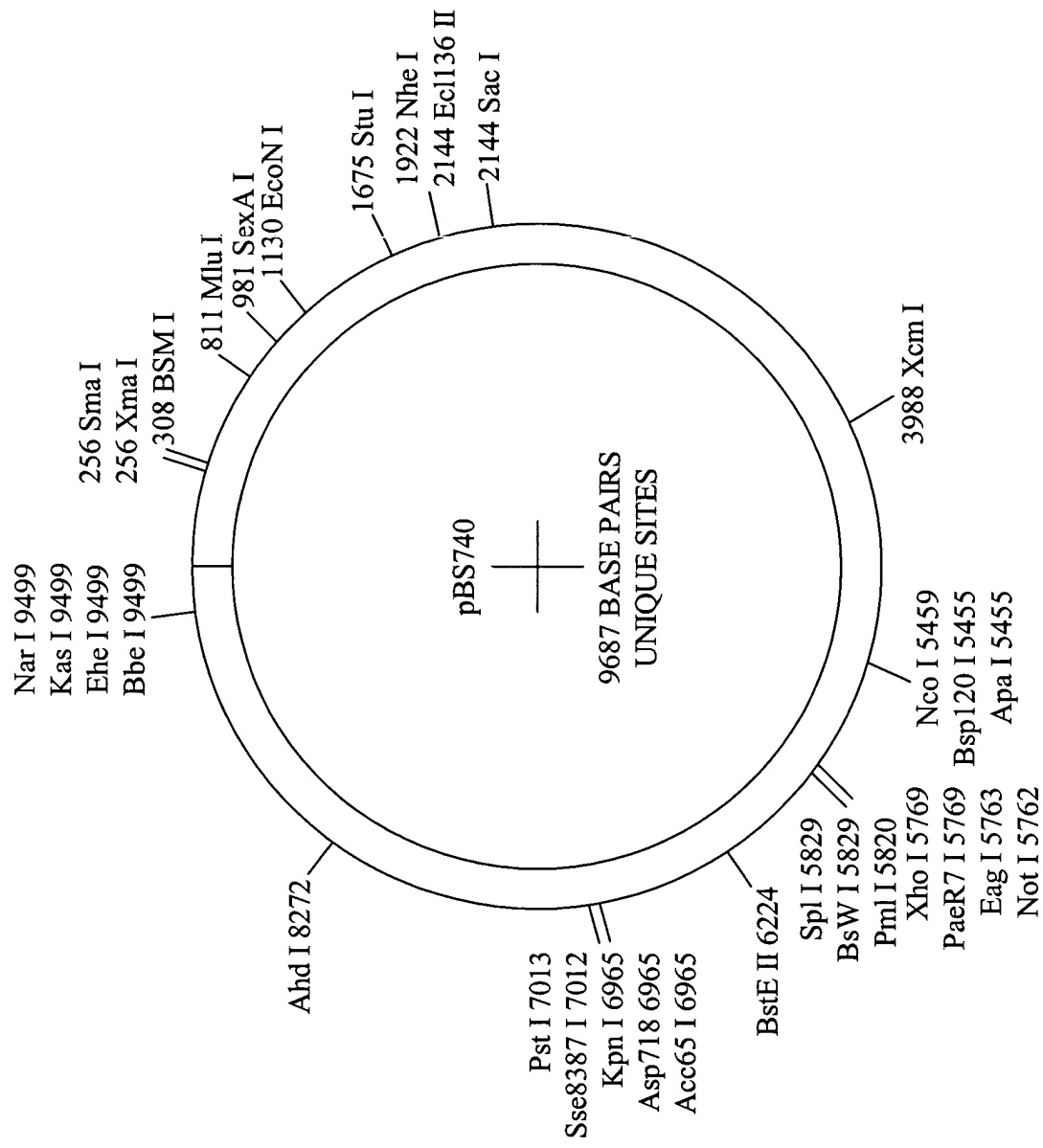


FIG. 12

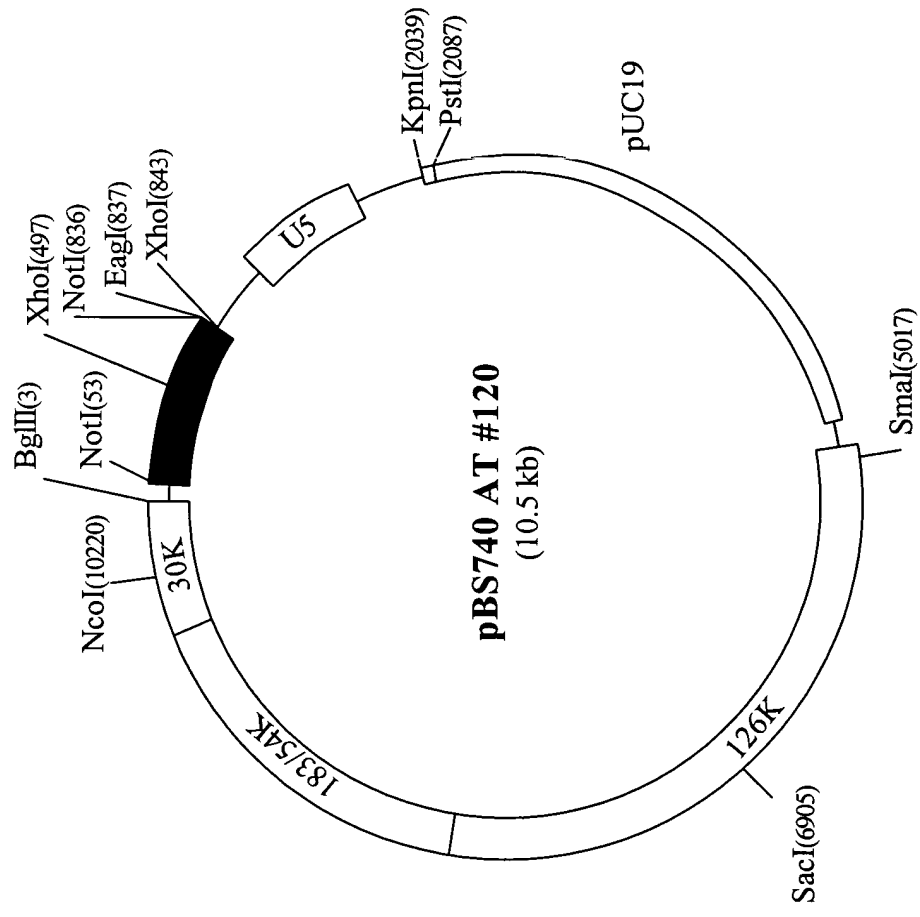


FIG. 13

740	AT	#120	27	TCCGAAACATTC	TTCG	TAGTGAAGCAAA	AATGGG	TTGAGTTTCG	CCAAGCTGTTTAGCAG
AA042085				TCCGAAACATTC	TTCG	TAGTGAAGCAAA	AATGGG	TTGAGTTTCG	CCAAGCTGTTTAGCAG
740	AT	#120	27	GCTTTT	TGCCAAGAGGAGAT	GCGAA	TTCTGATGGT	CTTTGATGCTGGTAAGAC	
AA042085				GCTTTT	TGCCAAGAGGAGAT	GCGAA	TTCTGATGGT	CTTTGATGCTGGTAAGAC	
740	AT	#120	27	CACAA	TCTTGTA	CAAGCTCAAGCTCGGAGAGAT	TGTCACCA	CCATCCCTACTATTGGTTT	
AA042085				CACAA	TCTTGTA	CAAGCTCAAGCTCGGAGAGAT	TGTCACCA	CCATCCCTACTATTGGTTT	
740	AT	#120	27	CAATGTGGAA	AACTGTGGAATACAAGAACAT	TAGTTT	CACCCGTGTGGGATGT	CGGGGGTCA	
AA042085				CAATGTGGAA	AACTGTGGAATACAAGAACAT	TAGTTT	CACCCGTGTGGGATGT	CGGGGGTCA	
740	AT	#120	27	GGACAA	AGATCCGTCCCTTGTGGAGACACTACTTCCAGAACACTCAAGGTCTAAATCTTTGT				
AA042085				GGACAA	AGATCCGTCCCTTGTGGAGACACTACTTCCAGAACACTCAAGGTCTAAATCTTTGT				
740	AT	#120	27	TGTTGATAGCAATGACAGAGACAGAGTTGTTGAGGCTCGAGATGAACTCCACAGGATGCT					
AA042085				TGTTGATAGCAATGACAGAGACAGAGTTGTTGAGGCTCGAGATGAACTCCACAGGATGCT					
740	AT	#120	27	GAATGAGGACGAGCTGCGTGATGCTGTGTGCTTGTTGTTT					
AA042085				GNATGAGNACGAGCTGCGTGATGCTGTGTGCTTGTTGTTT					

FIG. 14

Nucleotide sequence alignment of 740 AT #120 to *Oryza sativa* D17760

740 AT 120	27	AAATGGGGTTGAGTTTCGCCAAGCTGTTTAGCAGGCTTTTTC	CGAAAGAGATGCGAA	86
D17760	166	AGATGGGGCTCACGTTACGAAAGCTGTTTCAGCCGCCCTCTTC	CGCAAGAGAGATGAGGA	225
740 AT 120	87	TTCTGATGGTTGGTCTTGATGCTGCTGGTAAGACCACAATCTTG	TACAAGCTCAAGCTCG	146
D17760	226	TCCTCATGGTCGGTCTCGATGCGGCCGGTAAAAACCACCATCCT	CTACAAGCTCAAGCTCG	285
740AT 120	147	GAGAGATTGTCACCACCATCCCCTACTATTGGTTTCAATGTGGA	AACTGTGGAATACAAGA	206
D17760	286	GCGAGATCGTCACCACCTATCCCCACCATCGGTTTAAATGTCG	AAACTGTTGAGTACAAGA	345
740 AT 120	207	ACATTAGTTTCACCGTGTGGGATGTCGGGGGT	CAGGACAAGATCCGTCCCTTGTGGAGAC	266
D17760	346	ACATTAGCTTCACCGTTTGGGATGTTGGTGT	CAGGACAAGATCAGGCCCTGTGGAGGC	405
740 AT 120	267	ACTACTTCCAGAAACACTCAAGGTCTAATCTTTGTTGATAGCA	ATGACAGAGACAGAG	326
D17760	406	ACTATTTCCAGAAACACCCAGGGCCTCATTTTGTGTGGACAG	CAATGACAGAGAGCGTG	465
740 AT 120	327	TTGTTGAGGCTCGAGATGAACCTCCACAGGATGCTGAATGAGG	ACGAGCTGCCGTGATGCTG	386
D17760	466	TTGTTGAGGCCAGGGATGAGCTCCACCGTATGCTGAATGAGG	ATGAGCTACGTGATGCTG	525

FIG. 15A

740	AT	120	387	TGTTGCTTGTGTTTGCCAAACAAGCAAGATCTTCCAAATGCTATGAACGCTGCTGAAATCA	446
D17760		526	TGCTGCTGGTGTTTGCAAAACAACAAGATCTTCCCTAATGCCATGAACGCTGCTGAGATCA	585	
740	AT	120	447	CAGATAAGCTTTGGCCTTCACCTCCCTCCGTCAGCGTCATTGGTATATCCAGAGCACATGTG	506
D17760		586	CCGACAAGCTTGGTCTGCACTCCTTGCGGCCAGCGGCACTGGTACATCCAGAGCACATGTG	645	
740	AT	120	507	CCACTTCAGGTGAAGGGCTTTATGAAGTCTGGACTGGCTCTCCAACAACATCGCTGGCA	566
D17760		646	CTACCTCTGGTGAGGGGTTGTATGAGGGGCTTGACTGGCTTCCAACAACATTGCCAACA	705	
740	AT	120	567	AGGCATGATG	576
D17760		706	AGGCTTGAAG	715	

FIG. 15B

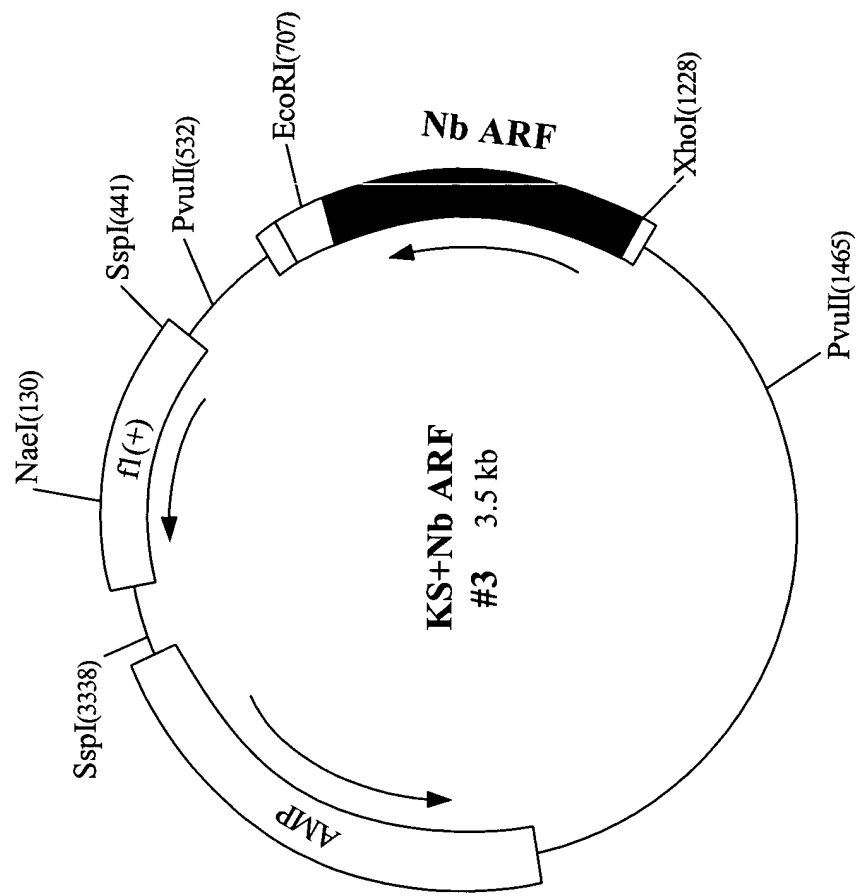


FIG. 16

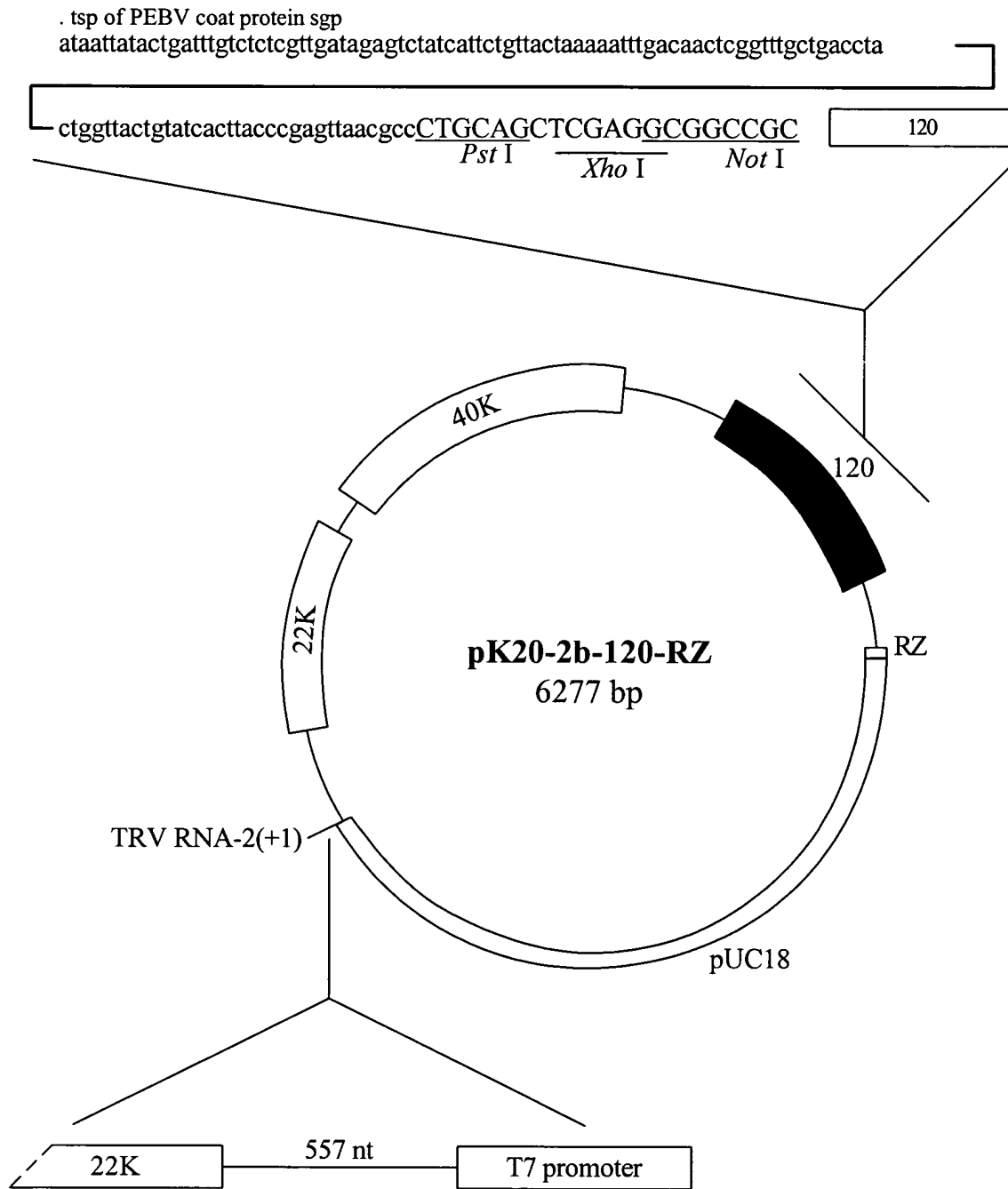


FIG. 18

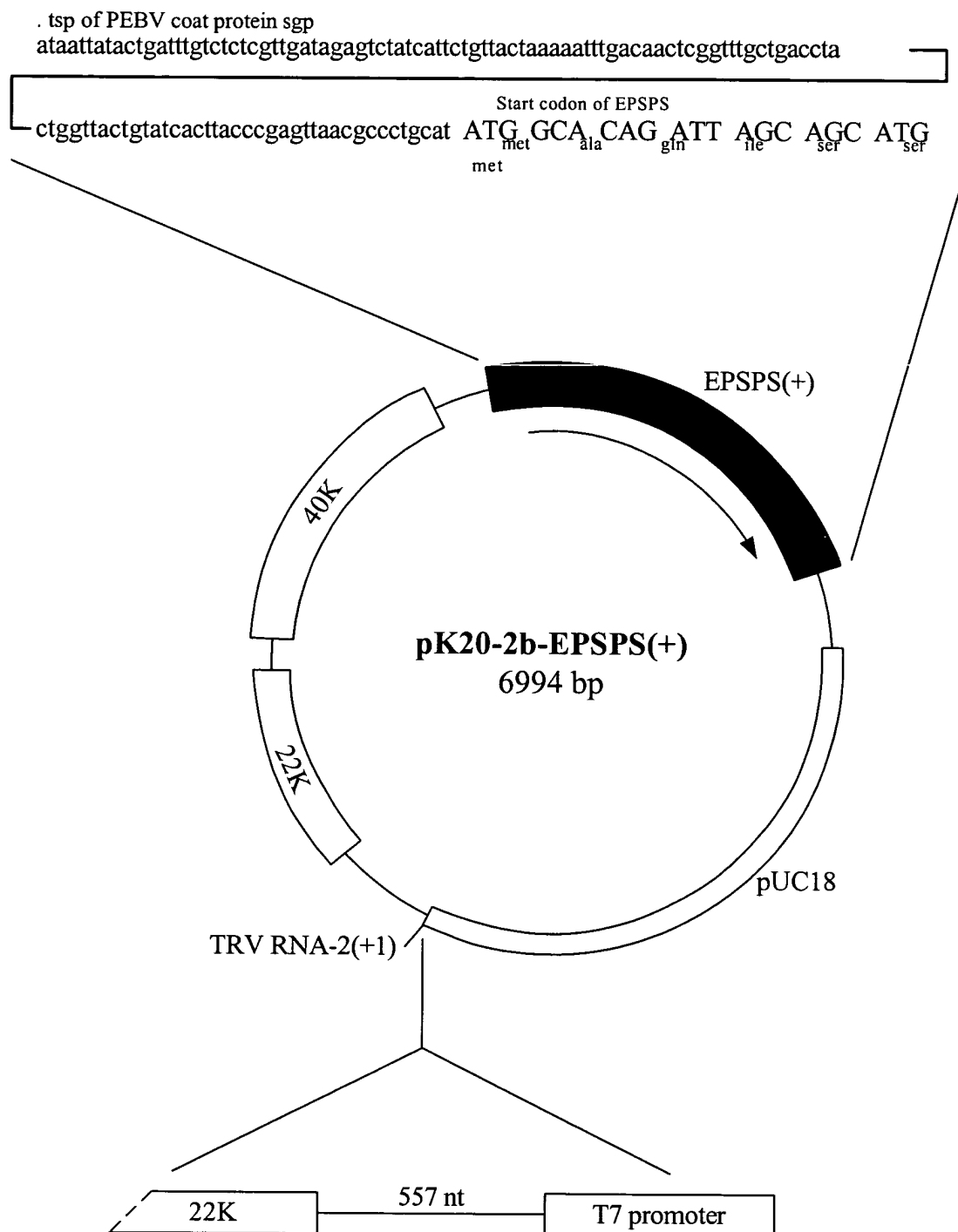


FIG. 19

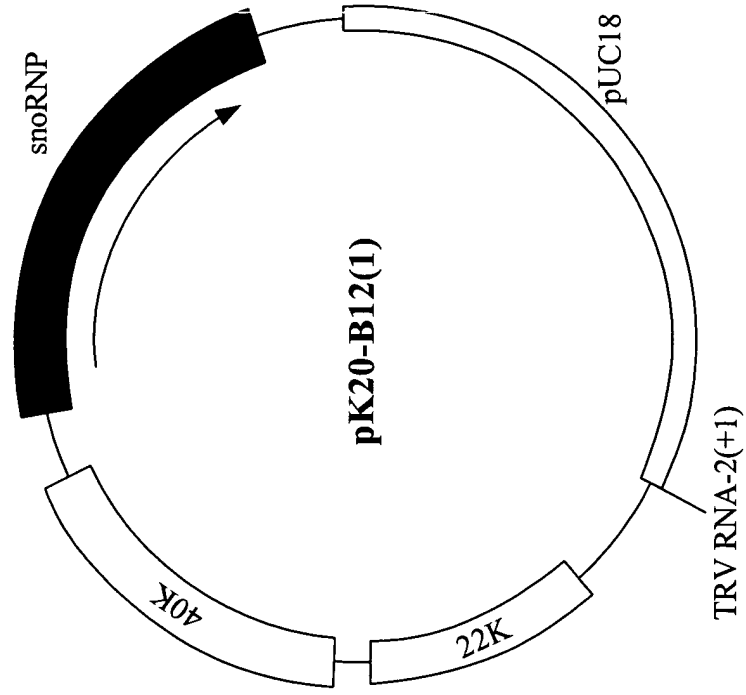


FIG. 20

GAAACCGCGAAGCAGCTCAGGTCACAATTTAGCGAGGATGTATCTCCAGTTTTC
CATCAATGAGAAATGGTGACAAAAGTTTACACCACTAAGAAAGAGTCACCACCTGGGT
TTGGCCACAGAAATCCGCTCACCCAGCCCGCTTTTCCCCCGATGATAAAATATTCAA
GGCAAAAGAGTGCTTCTGAAGAAAGCGATTGGTTTGCTTCCAACCCAAAAGCCACC
TCAAAAGTACTAAAAGTTTTTGCTATTGTGTATTGCTTTTCTACTCATGGTTATTA
TGTTTCTCTGTCTTGTGCGTTGTTGACGTGACTCTTGATTTGCAACTCAAAATTGC
ATGGCAGCAATTCAAAACCTCATATCTAATTG

FIG. 21

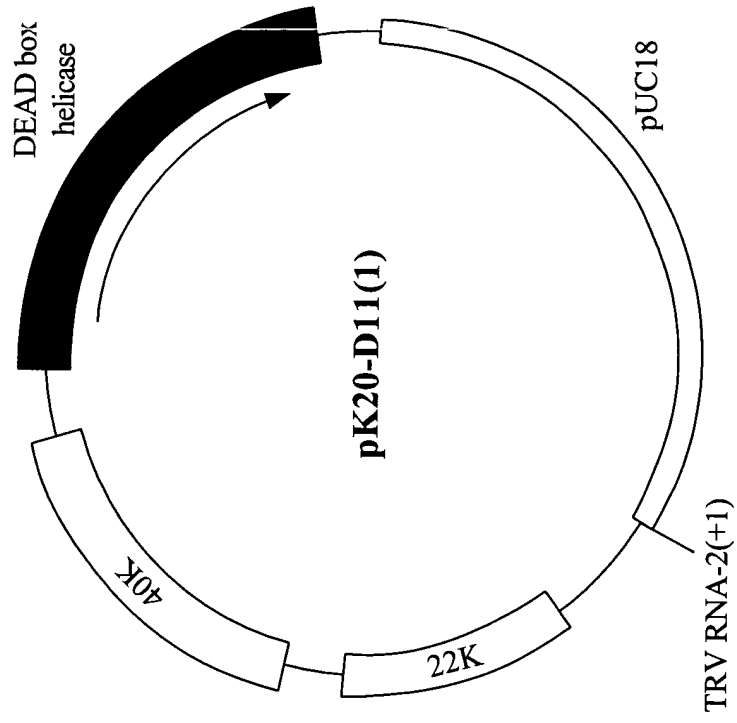


FIG. 22

GCCACGGTCCGATGAGGCCAAGTTGACCCCTTCATGGACTTGTACAGCACTACA
TTAAATTGAGTGAAACCGAGAAAAACCGGAAACTAAATGATCTGTGGACGCCCTT
AACTTCAACCAAGTTGTATATTTGTCAAGAGTGTAAGTCGGGCAGCACAGCTG
GATAAATTACTAGTGGAGTGTAATTTTCATCTATCTGCATCCACTCTGGCATGA
CGCAGGAAGAAAAGATTGACTCGCTACAAAGGTTTCAAGGAGGGCCACAAGAGAAAT
TCTTGTGCAACTGATCTGGTTGGTAGGGGCATTGACATCGAAAAGGTCACATT
GTTATTAACTATGACATGCCAGATTCTGCAGACACGTAATCTTCAAGAGTGGGTC
GAGCTGGTAGGTTTGGAACTAAAGGCCTTGCCATCACATTTTGTGCATCTGCATC
AGATTCTGATGTTCTAAATCAGGTTCAAGAAAGGTTTGAAGTAGACATAAAAGAG
CTTCCTGAGCAGATTGATACTTCTACGTACATGCCATCTTAGCGATCTCGAGAGC
TTCCAGCAATATCAAGTCATTTAAAAGATGGGGGGAACCTGACAGGTGTTTGTCTA
TTGTGTGTTAATTTGAAGAAATGGGGGGCTCCTACTATATGCTCTTGCACGTCTGA
GCTGCTGTACCCCTTGTGTAAC TACTCTTTCTCCTCCAGTTTAAAGAGGAGCACCTA
ACAAATG

FIG. 23

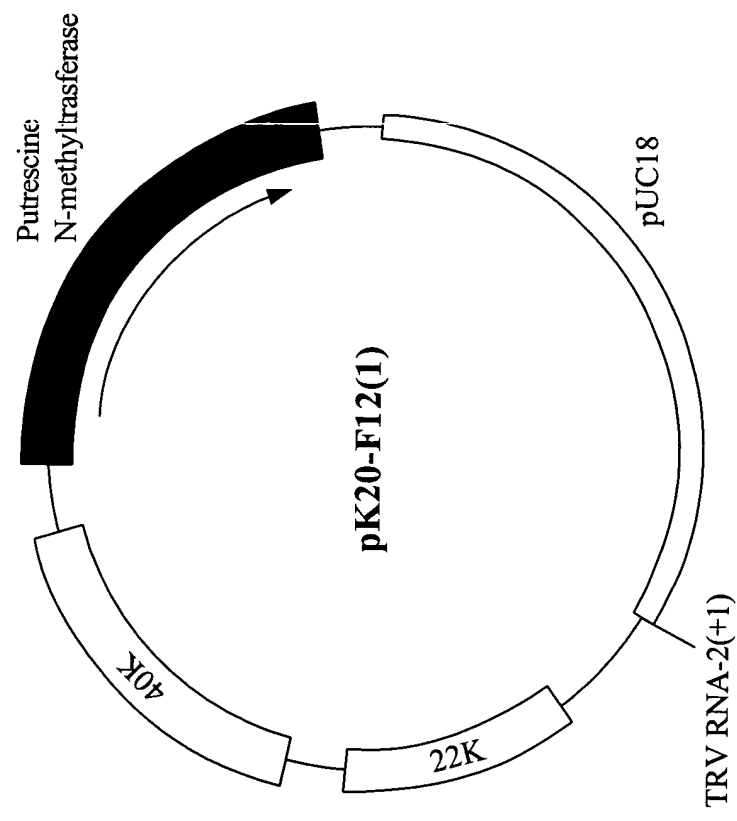


FIG. 24

GGTCAAATCCAAATTAGCACCTCTCAAGTTCTACAACCTCTGATATTCACAAAGCA
CCATTCAATTTGCCATCTTTTCGCCAGAAGTATGATCGAGTCTTAATCAAGTGAAC
AATGAACACACTGGTGGTACAATCATTTGGACCAAGATCGAGTCTTTATCAAGTGAAT
AAATAAAGTGAAATGCCAACGCATTGTATGAATCCAGTAGTAATTAATCATAAATTCG
GATTCACCAATTAGTGTAATTCCTTTCTGTGGTGTGGTCTTTTCATATAAATTT
TTCCTGCTGTGTTTTTGATATGACGTTTCAACTCAATCCACGCAAAATCATTTTCAT
T

FIG. 25

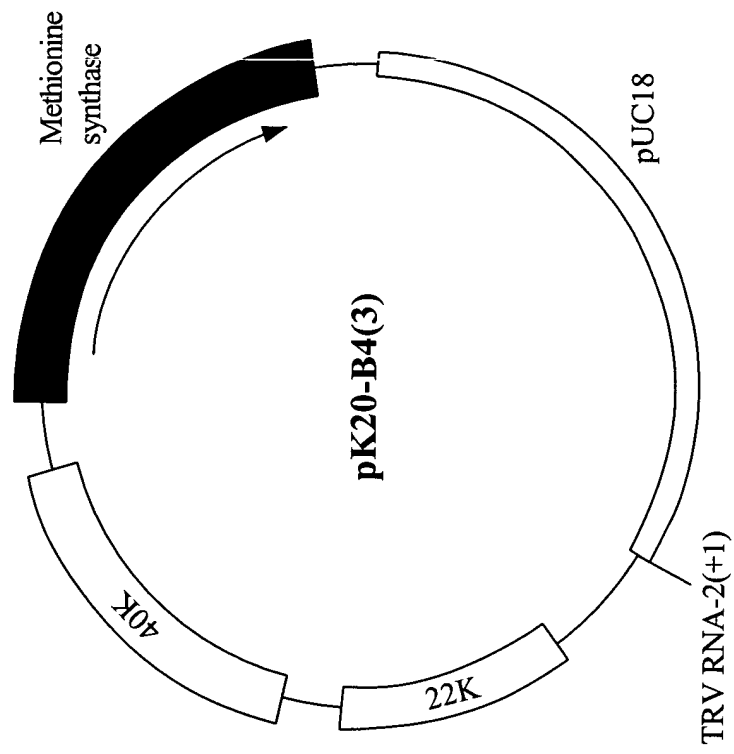


FIG. 26

GGCCTTTTACTTGAACTGGGCTGTCCACTCCTTCAGAAATCACC AACGTCGGCATT
CAAGACACCAACCAGATCCACACACATGTGCTACTCCA ACTTCAATGACATTA
TCCACTCTATCATTTGACATGGATGCTGATGTGATCACA ATTGAGAACTCACGGTC
CGATGAGAAAGCTCCTCTCAGTTTTTCAGGGAGGAGTTAAGTATGGTGTGGAATT
GGCCCCGGTGTCTATGATATCCACTCCCCTAGAAATACCATCAACGGAAGAGATTG
CTGACAGAGTTAACAAAGATGCTTGTCTTCTTGACACCAACATCTTGTGGTCAA
CCCAGATTGTGGTCTCAAGACTCGCAAGTACGCTGAGGTTAAAGCCAGCCCTCGAG
AACATGGTTTTCTGCTGCCAAGGCCATCCGCACCCAACTTGCCAGCACCAAGTGAG
TCAGATGAAGGAGTCGCGACATATCAAGATTCCCCTTTTTCATGA AACAGAAAATT
CTATGTTGATTTTTTAATCATTGTGTGGCAACAATAATTGTGTAGGTTAGCT
CTGCCCCGCTGGGCATTTTCTTCTTGTGTTTGAGCCATTTCCTTTTTCGGAAGAAA
TATATCCAAATGTATTATGATGTTTTTATGGGTCGATTTTGGTTAC

FIG. 27

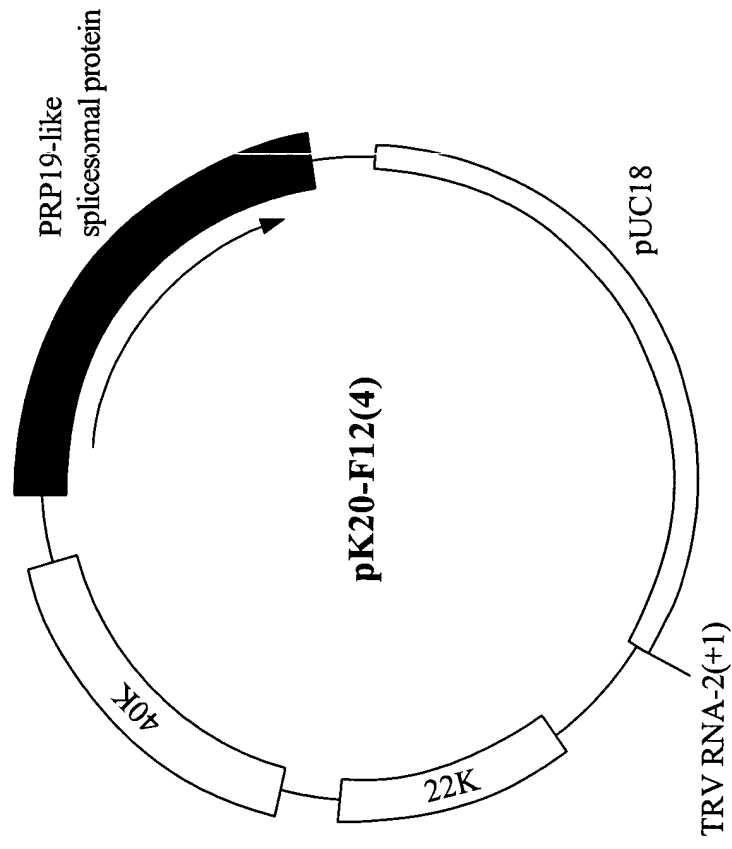


FIG. 28

GGATGTGTTGATCAATGGGAAAAGAGCTGCTGAGGACGAGGAGATGGGTCCTGAT
GGCAAGAAAAATTGCCCCCTGGAAATATCAAACTCTGTCAATTGAGACTCTTACGGAAT
GTAATGCTGCTCTTTCACAGCAAAGGAAAAGACGACAGATACCGGCAACACTGGC
CTCTGTGGATGCTCTGGAAAGATATACCCAACTGAATAGTTATCCTCTTCACAAA
ACCAACAACCTGGTATTTTGTCTTTTGGATATTCAATTATCCTAAGGACTTAAATTG
CTACTGGTGGTGTGATTCAAAATGCTGTGGTCTTTTGATCGTCCCTTCAGGACAAAT
GAGGGTGAAC TAGTGGTCTCTGGCTCAGCAGATAAGACAGTTCGTTTGTGGCAAA
GTTCTGAAAAATGGGAACTATGACTGTAGGCATGTCCTTGAAGAATCATA CAGCAGA
GGTGCAAGCTGTCACTGTCCATGCAACCAATAACTATTTTGTGACTGCTTCTCTT
GATAGCACATGGTGCTTTTATGATCTTGCTTCTGGCTTATGCCCTTGACACAGGTGG
CAGATGCTACAGAACTCTGAGGGTTACACATCCGCAAGCTTTCCCA CCGTGAATTGG
TCTTGATCCCTTGGGAACAGGGACCTCAGGGTCTCTGGTTCAGATTTTGGGATTGT
AAAAAGTCCAGG

FIG. 29

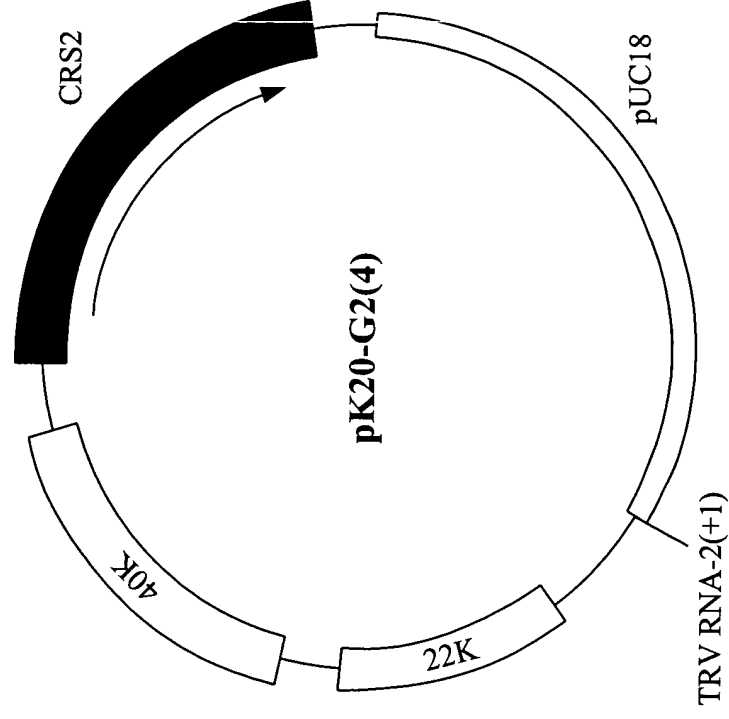


FIG. 30

GCTCCAGAGCCCTAATGGGGTTAAGTTTGAGTACACTCCTTGGTTAATTGTCCGA
TNGGAAATCCCGGTAAACAAGTATCATGGGACTCGCCACAAATGTTGGTTTTGAAA
TGATTGATCGAGTTTCTCAAGAGGAGGGAATCGTATTAAACACAATACAGTCAAA
GGCTTTGATAGGAAATAGGTTCGATAGGGAGGTACCTGTGGTATTGGCAAGCCT
CAAGCCTACATGAATTCAGTGGAGAAATCGGTCGGACCACTTGCTGCATATTATC
AGGTGCCCTCTGCGTCACATCCTTCTGGTTTATGATGAGATGAGCTTACCAAATGG
TGTCTGAGGCTTCAGCCTAAAGGAGGACATGGCCAGCATAAATGGGGTGAAAAAGT
GTGATGGAGCATTTGGATTGTCCGAGGGAATTTCCCGATTTTGCATAGGCATAG
GAAATCCACCTGGAACTATGGACATGAAGGCATATCTTCTACAGAAATTCAGTGA
TACAGAGCGGAAGCAGGTGGATGCAGCACTTAATCAAGGAGTTGATGCTGTCAAG
ACGGTAGTATTGGAAGGCTTTGGTAGTAAAAATTCACGATTTAATATAGGACAGA
AATACAAAGTATCACAAAGTTTGATGAAAATTGAAATCTAAAATGAAAGGTGTAAAA
GCACGAAAGATTTACTGATAACTTCAAGTCTAAAAATTAAAGGTGTAAAAAGACCC
CAAGG

FIG. 31